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EXAMINER

BELLO, AGUSTIN

ART UNIT	PAPER NUMBER
2633	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,419

Applicant(s)

NAKAJIMA ET AL.

Examiner

Agustin Bello

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-19,21-34,38 and 39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,14-19,21,32-34,38 and 39 is/are rejected.
- 7) ☒ Claim(s) 4-13 and 22-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 14, 15, 17, 18, 19, 32, 33, and 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa (U.S. Patent No. 5,717,510).

Regarding claims 1, 19, and 38-39, Ishikawa teaches a transmission characteristic equalizing system comprising: at least one optical tunable filter (reference numeral 50 in Figure 4) having a variable transmission factor versus wavelength characteristic (column 10 lines 62-65) and placed along an optical transmission path (reference numeral 43 in Figure 4) between a transmitting station (reference numeral 41 in Figure 4) and a receiving station (reference numeral 42 in Figure 4) in a wavelength division multiplexing optical communication system (column 2 lines 21-29, 35-37); a transmission characteristic measurement unit (reference numeral 53 in Figure 4) measuring transmission characteristics of optical signals of different wavelengths transmitted over the optical transmission path; and a transmission characteristic control unit (column 12 lines 7-14), on the basis of the measurements made by the transmission characteristic measurement unit, controlling amounts of pre-emphasis (e.g. wavelength control, prechirp, or power; column 12 lines 7-14 and column 19 lines 17-21) in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter (column 12 lines 7-14) to thereby equalize the transmission characteristics for the optical signals, wherein the

Art Unit: 2633

transmission characteristic control unit calculates optimum allocation between a controlled variable of the amounts of pre-emphasis (column 19 lines 17-21) in the transmitting station and a controlled amount of the transmission factor versus wavelength characteristic of the optical tunable filter (column 12 lines 7-14) and controls the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation to thereby equalize and optimize the transmission characteristics (optimization described in column 11 lines 54-62 and matching of wavelengths described in column 12 line 14).

Regarding claims 14 and 32, Ishikawa teaches the system according to claim 1, wherein the transmission characteristic measurement unit is provided in the receiving station (reference numeral 53 in Figure 4).

Regarding claims 15 and 33, Ishikawa teaches the system according to claim 1, wherein the transmission characteristic control unit is provided in the receiving station (reference numeral 53 in Figure 4) and the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter are controlled by the receiving station (as indicated by the dashed line output of a control signal from the receiver to the tunable filters and transmitter).

Regarding claims 17 and 18, Ishikawa teaches that the amount of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter is controlled via one of an overhead signal, a control signal superimposed on a main signal amplitude (column 12 lines 38-40), and a dedicated control signal.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa.

Regarding claims 3 and 21, Ishikawa differs from the claimed invention in that Ishikawa fails to specifically teach that the transmission characteristic control unit first controls only the transmission factor versus wavelength characteristic of the optical tunable filter to temporarily equalize the transmission characteristics for the optical signals, then calculates the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at the time of the temporal equalization of the transmission characteristics, and controls both the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station according to the optimum allocation of control to equalize and optimize the transmission characteristics. However, one skilled in the art would clearly have recognized that the order of control for the system of Ishikawa could have been varied so that the transmission characteristic control unit first controls only the transmission factor versus wavelength characteristic of the optical tunable filter to temporarily equalize the transmission characteristics for the optical signals, then calculates the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at the time of the temporal equalization of the transmission characteristics, and controls both the transmission factor versus wavelength characteristic of the

Art Unit: 2633

optical tunable filter and the amounts of pre-emphasis in the transmitting station according to the optimum allocation of control to equalize and optimize the transmission characteristics. One skilled in the art would have been motivated to tune the filter, calculate the optimum allocation, then control the transmitter and filter according to the calculated allocation in order to base the pre-emphasis of the transmitter on the transmission factor versus wavelength characteristic of the tunable filter at a specific period of time, thereby establishing a baseline from which adjustments could be made. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to allow the transmission characteristic control unit to first control only the transmission factor versus wavelength characteristic of the optical tunable filter to temporarily equalize the transmission characteristics for the optical signals, then calculate the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at the time of the temporal equalization of the transmission characteristics, then control both the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station according to the optimum allocation of control to equalize and optimize the transmission characteristics.

5. Claims 16 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Terahara (U.S. Patent No. 6,219,176).

Regarding claims 16 and 34, Ishikawa differs from the claimed invention in that Ishikawa fails to specifically teach that the transmission characteristic control unit is provided in the transmitting station and the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter are controlled by the transmitting station. However, Ishikawa does teach that a transmission characteristic

Art Unit: 2633

changing unit (reference numeral 49 in Figure 4) can be placed at the transmitter for changing the amounts of pre-emphasis in the transmitting station. Furthermore, it is well known in the art to base a transmission characteristic control unit in a transmitting station in order to control downstream elements. Terahara, in the same field of endeavor, teaches it is well known in the art to transmit a signal from the transmitter to downstream elements in order to control their transmission characteristics (e.g. "SV SIGNAL" in Figure 23). One skilled in the art would have been motivated to place the transmission characteristic control unit in the transmitting station in order to reduce the amount of hardware at a distant receiver or to divide the tasks of calculation and controlling between two elements (e.g. receiver and transmitter respectively), thereby simplifying the system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to place the transmission characteristic control unit in the transmitting station.

Response to Arguments

6. Applicant's arguments filed 1/6/04 have been fully considered but they are not persuasive. The applicant argues that Ishikawa fails to specifically teach that the characteristic control unit provides an "optimal allocation" between the transmitting station and the tunable optical filter. However, the examiner believes the opposite to be true. For example, Ishikawa specifically discloses (column 11 lines 54-62):

"Based on the result of the transmission characteristic measurement, the emission wavelength of the tunable light source 44 and the wavelength transmission characteristic of the tunable filters 45 and 50 are set so as to achieve the best transmission characteristic."

Art Unit: 2633

Clealry, an optimum allocation between the settings of the light source and the tunable filter is sought in order to achieve an optimal transmission characteristic. Ishikawa further discloses (column 12 lines 9-15) that the transmission characteristic measuring section:

“...determines the emission wavelength that maximizes the transmission characteristic, and sends control information to the drive circuit 49 to control the wavelength to the determined value while applying control information to the tunable filters 45 and 50 to control their transmission wavelength characteristic to match that emission wavelength.”

Based on these disclosures, the examiner has concluded that Ishikawa anticipates the claimed invention when given the broadest reasonable interpretation.

The applicant also argues that Ishikawa fails to anticipate the claimed invention since Ishikawa fails to disclose or suggest that a calculation is performed in order to obtain the optimum allocation between the transmitter and the tunable filter. However, the examiner disagrees. An example in Ishikawa of a calculation used to determine the optimum allocation is the measurement of the bit error rate. As is well known in the art, in order to measure the bit error rate of a signal, the percentage of the bits received in error must be compared to the total number of bits received. Clearly, a calculation in the form of division takes place in order to determine the bit error rate. Furthermore, Ishikawa provides an alternative method of calculating the bit-error rate wherein at least a few calculations would be requires (column 13 lines 14-23). Moreover, Ishikawa provides another alternative for measuring the bit-error rate (e.g. eye-pattern of column 13 lines 1-13) as well as a means for controlling the transmitter and filter (e.g.

Art Unit: 2633

“computer processing”). Clearly, calculation would take place in the computer processing means disclosed by Ishikawa in determining the optimum allocation between the transmitter and filter.

The applicant further argues that the system of Ishikawa neither discloses nor suggests features to equalize transmission characteristic respectively associated with all the WDM signals. However, the opposite is true. Ishikawa specifically teaches that the disclosed invention provides a peripheral technique that enables wavelength division multiplexing (column 2 lines 21-28). Furthermore, as discussed above, the equalization of transmission characteristics takes place in Ishikawa via adjustments made to both the transmitter of the system and downstream filter.

Next, the applicant argues that the examiner has failed to meet the requirements of a prima facie obviousness rejection because the examiner has failed to provide motivation evidenced in the record. However, the examiner in the previous office action specifically provides that:

*“One skilled in the art would have been **motivated** to tune the filter, calculate the optimum allocation, then control the transmitter and filter according to the calculated allocation in order to base the pre-emphasis of the transmitter on the transmission factor versus wavelength characteristic of the tunable filter at a specific period of time, thereby establishing a baseline from which adjustments could be made.”*

As such, it is clear that motivation for modifying Ishikawa was provided by the examiner in accordance with knowledge generally available in the art.

Allowable Subject Matter

7. Claims 4-13 and 22-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or fully suggest that the transmission characteristic measurement unit measures first and second transmission characteristic values having a correlation with each other as the transmission characteristics, and the transmission characteristic control unit first controls only the transmission factor versus wavelength characteristic of the optical tunable filter to equalize the first transmission characteristic values and then temporarily equalize the second transmission characteristic values with reference to the equalized first transmission characteristic values, then calculates the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at the time of temporary equalization of the second transmission characteristic values, and controls both the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station according to the optimum allocation to thereby equalize the second transmission characteristic values. The prior art fails to teach or fully suggest the methodology for calculation of the optimum allocation involving two correlated transmission characteristics.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2633

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sato, Miyazaki, Suzuki, Salinger, Taga, Swanson, Alavie, Stephens, Manna, and Roberts present relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB


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